WHAT IS CLAIMED IS:

1. A soil aerator, comprising:

a frame assembly having a front end and a rear end;

an aeration device coupled to the frame assembly;

a front axle member to support the frame assembly, the front axel member located forward of the aeration device;

a rear axle member to support the frame assembly; the rear axel member located aft of the aeration device;

a weight transfer system coupled to the frame assembly, the weight transfer system being operable to apply a moment to the aeration device to transfer a portion of the aeration device's weight to the front axle member or the rear axle member.

2. The soil aerator of claim 1, wherein the frame assembly is hinged and the aeration device is urged about the hinge axis by the weight transfer system.

3. The soil aerator of claim 1, wherein the at least one front axel member is coupled to a roller.

4. The soil aerator of claim 3, further comprising a second rear axle member and wherein each rear axle member is coupled to a wheel.

5. The soil aerator of claim 1, wherein the weight transfer system includes a first spring member coupled to the frame assembly the aeration device.

6. The soil aerator of claim 5, wherein the weight transfer system further includes a second spring member coupled to the rear axel member and the aeration device.

7. The soil aeration of claim 1, wherein the weight transfer system is adapted to transfer a variable fraction of the weight of the aeration device to at least one of the front axle member and the rear axle member such that a head weight of the aeration device can be varied.

8. The soil aerator of claim 1, comprising at least two rear axle members each coupled to the frame by a separate suspension system.

9. The soil aerator of claim 1, wherein the weight transfer system includes at least two spring members that apply opposite moments to the aeration device.

10. The soil aerator of claim 1, wherein the weight transfer system includes a constant force spring.

11. The soil aerator of claim 1, wherein the soil aeration device includes a planetary gear system to rotate and translate a plurality of tine shafts bearing aeration tines.

12. The soil aerator of claim 1, wherein the aeration tines include an arcuate soil fracturing edge.

13. A soil aerator, comprising:

a frame member having a front end and rear end;

means for aerating soil coupled to the frame assembly;

front support means to support the frame assembly as it travels across a ground surface, the front frame support means located forward of the aerating means;

rear support means to support the frame assembly as it travels across the ground surface, the rear support means located aft of the aerating means;

weight transfer means coupled to the frame assembly to apply a moment to transfer a portion of the aerating means' weight to the front support means or the rear support means.

14. The soil aerator of claim 13, wherein the frame assembly is hinged and the aerating means is urged about the hinge axis by the weight transfer means.

15. The soil aerator of claim 13, wherein the at least one front support means includes a roller.

16. The soil aerator of claim 15, wherein the rear support means comprises at least two rear axle members and wherein the rear axle members are coupled to separate wheels.

17. The soil aerator of claim 13, wherein the weight transfer means includes a first spring member coupled to the frame assembly and the aerating means.

18. The soil aerator of claim 17, wherein the weight transfer means further includes a second spring member coupled to the rear support means and the aerating means.

19. The soil aerator of claim 13, wherein the weight transfer means is adapted to transfer a variable fraction of the weight of the aerating means to the front support means or the rear support means such that a head weight of the aerating means can be varied.

20. The soil aerator of claim 13, comprising at least two rear axle members each coupled to the frame member by a separate suspension system.

21. The soil aerator of claim 13, wherein the weight transfer means includes at least two spring members that apply opposite moments to the aerating means.

22. The soil aerator of claim 13, wherein the weight transfer means is adapted to transfer a variable fraction of the weight of the aerating means to the front support means or the rear support means, such that a head weight of the aeration device can be varied.

23. The soil aerator of claim 13, wherein the aerating means includes a planetary gear system to rotate and translate a plurality of tine shafts bearing aeration tines.

24. The soil aerator of claim 23, wherein each aeration tine includes an arcuate soil fracturing edge.